JP2006126.030102

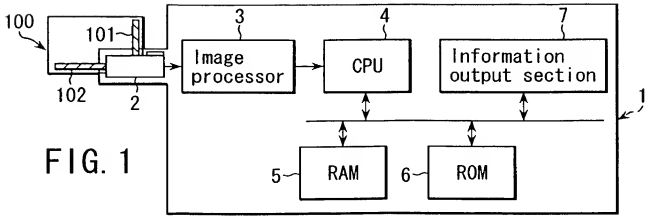


FIG. 1

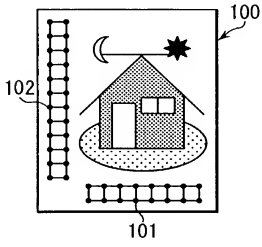


FIG. 2A

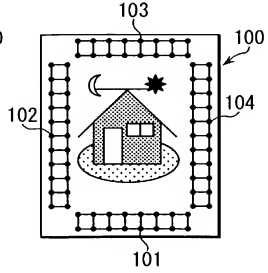


FIG. 2B

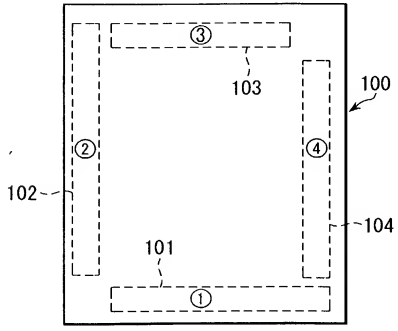


FIG. 3

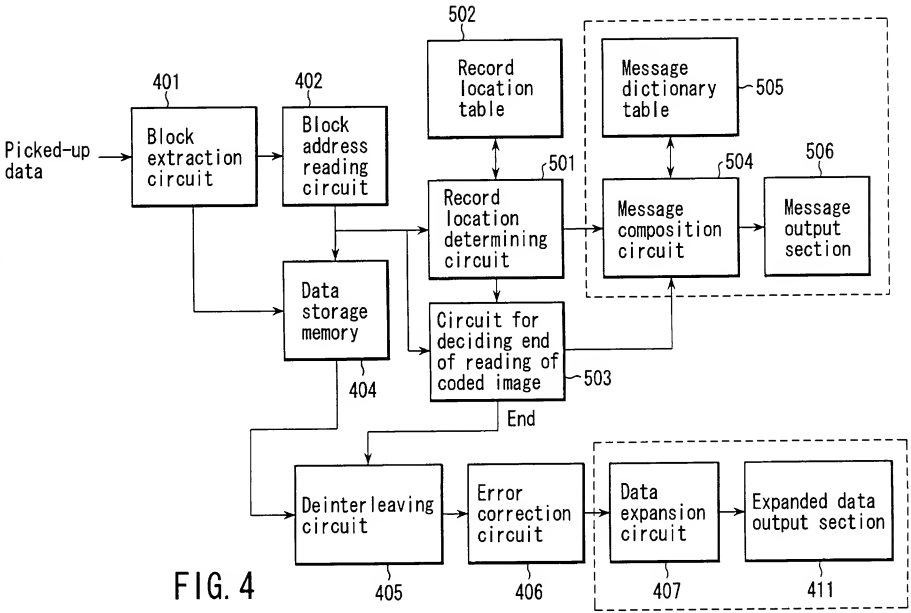

Picked-up data
401
Block extraction circuit
402
Block address reading circuit
502
Record location table
Message dictionary table
505
501
Record location determining circuit
504
Message composition circuit
506
Message output section
Data storage memory
404
Circuit for deciding end of reading of coded image
503
End
Deinterleaving circuit
405
Error correction circuit
406
Data expansion circuit
407
Expanded data output section
411

FIG. 4

Block ID	Record location	Message 1	Message 2	Message 3	Message 4
1～n	①	Code along lower short side is read	Code is read incompletely. Read code along upper short side.	Too great deterioration occurs in codes along both short sides. Replace card with new one.	Deterioration in code along lower short side cannot be corrected. Read code along upper short side.
n+1～n+m	②	Code along left long side is read	Code is read incompletely. Read code along right long side.	Too great deterioration occurs in codes along both long sides. Replace card with new one.	Deterioration in code along left long side cannot be corrected. Read code along right long side.
n+m+1～ n+m+p	③	Code along upper short side is read	Code is read incompletely. Read code along lower short side.	Too great deterioration occurs in codes along both short sides. Replace card with new one.	Deterioration in code along upper short side cannot be corrected. Read code along lower short side.
n+m+p+1～ n+m+p+q	④	Code along right long side is read	Code is read incompletely. Read code along left long side.	Too great deterioration occurs in codes along both long sides. Replace card with new one.	Deterioration in code along right long side cannot be corrected. Read code along left long side.

FIG. 5

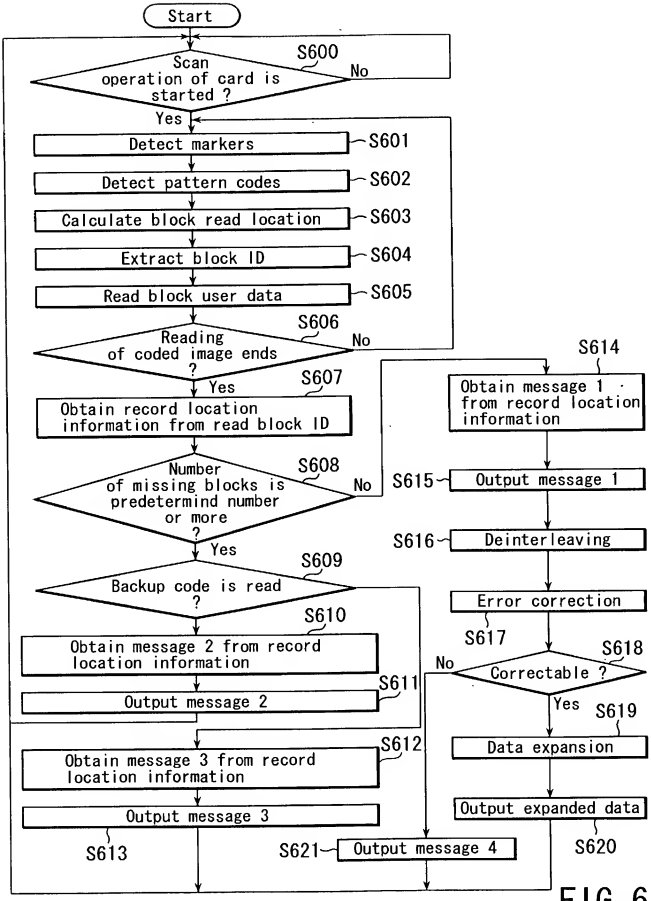

Start
Scan operation of card is started ?
S600
No
Yes
Detect markers
S601
Detect pattern codes
S602
Calculate block read location
S603
Extract block ID
S604
Read block user data
S605
Reading of coded image ends ?
S606
No
Yes
Obtain record location information from read block ID
S607
Number of missing blocks is predetermind number or more ?
S608
No
Yes
Backup code is read ?
S609
Obtain message 2 from record location information
S610
Output message 2
S611
Obtain message 3 from record location information
S612
Output message 3
S613
Obtain message 1 from record location information
S614
Output message 1
S615
Deinterleaving
S616
Error correction
S617
Correctable ?
S618
No
Yes
Data expansion
S619
Output expanded data
S620
Output message 4
S621

FIG. 6

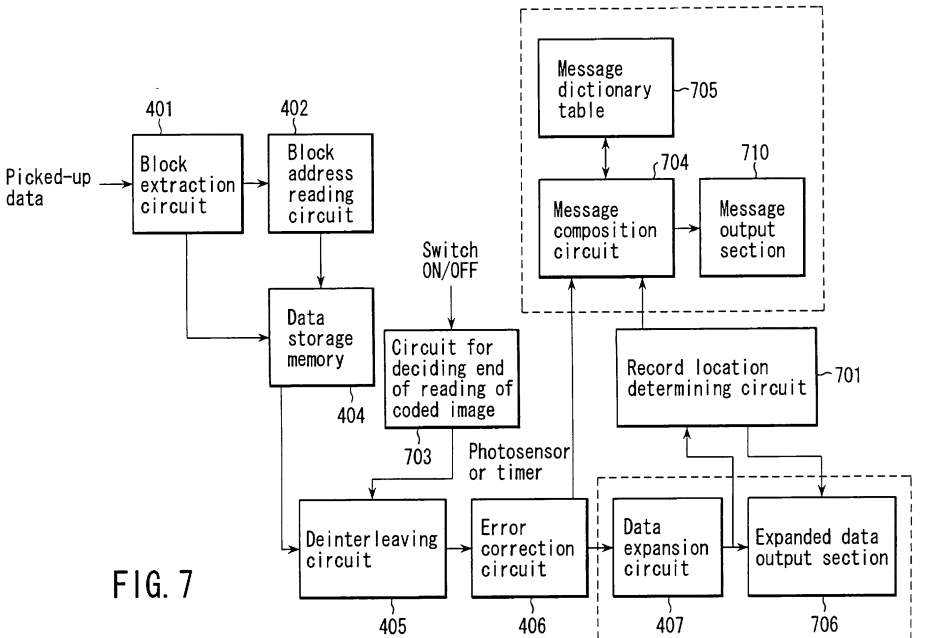
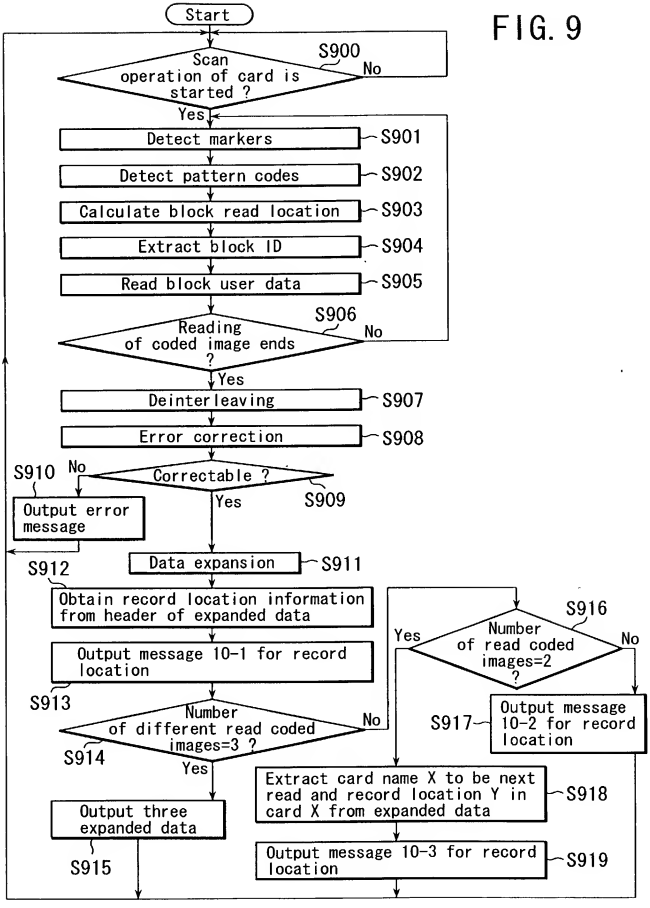

Picked-up data
401
Block extraction circuit
402
Block address reading circuit
Data storage memory
404
Switch ON/OFF
Circuit for deciding end of reading of coded image
703
Photosensor or timer
Message dictionary table
705
704
Message composition circuit
710
Message output section
Record location determining circuit
701
Deinterleaving circuit
405
Error correction circuit
406
Data expansion circuit
407
Expanded data output section
706

FIG. 7

Record location	Message 10-1	Message 10-2	Message 10-3
①	Code along lower short side is read	Keep reading code along left long side of same card	Read code Y on card X
②	Code along left long side is read	Keep reading code along lower short side of same card	Read code Y on card X
③	Code along upper short side is read	Keep reading code along right long side of same card	Read code Y on card X
④	Code along right long side is read	Keep reading code along upper short side of same card	Read code Y on card X

FIG. 8

FIG. 9


Start
Scan operation of card is started ?
S900
No
Yes
Detect markers
S901
Detect pattern codes
S902
Calculate block read location
S903
Extract block ID
S904
Read block user data
S905
Reading of coded image ends ?
S906
No
Yes
Deinterleaving
S907
Error correction
S908
Correctable ?
S909
No
Yes
S910
Output error message
Data expansion
S911
S912
Obtain record location information from header of expanded data
Output message 10-1 for record location
Number of different read coded images=3 ?
S913
No
S914
Yes
Output three expanded data
S915
Number of read coded images=2 ?
S916
Yes
No
Output message 10-2 for record location
S917
Extract card name X to be next read and record location Y in card X from expanded data
S918
Output message 10-3 for record location
S919

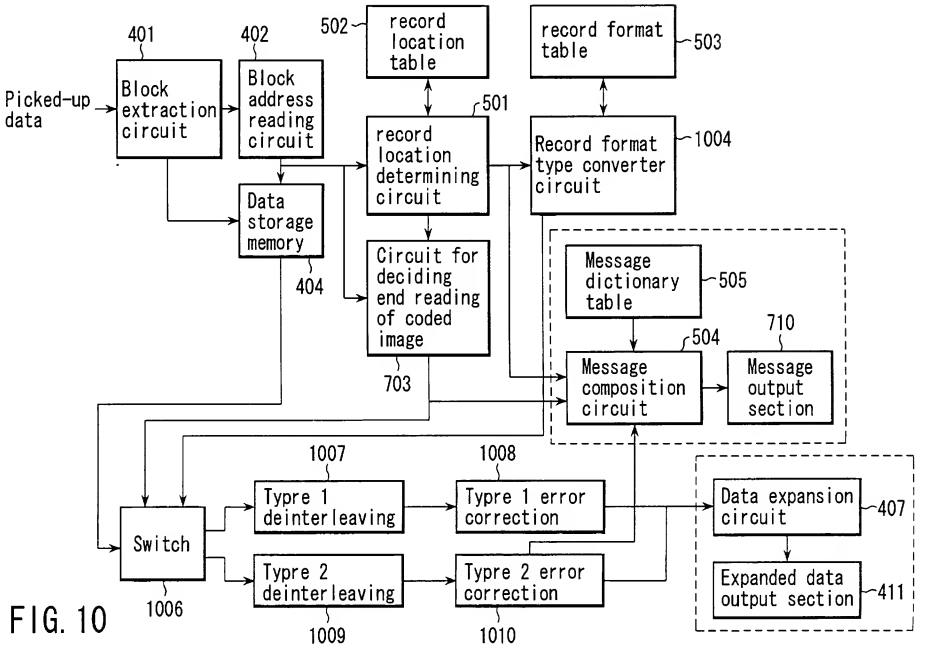

Picked-up data
401
Block extraction circuit
402
Block address reading circuit
502
record location table
record format table
503
501
record location determining circuit
Record format type converter circuit
1004
Data storage memory
404
Circuit for deciding end reading of coded image
703
Message dictionary table
505
504
710
Message composition circuit
Message output section
1007
1008
Switch
1006
Typre 1 deinterleaving
Typre 1 error correction
Typre 2 deinterleaving
Typre 2 error correction
1009
1010
Data expansion circuit
407
Expanded data output section
411

FIG. 10

Block ID	Record location	Data type	Record format
1～n	①	Control data/program	Type 1
n+1～n+m	②	Material data (image)	Type 2
n+m+1～n+m+p	③	Control data/program	Type 1
n+m+p+1～n+m+p+q	④	Material data (sound)	Type 2

FIG. 11

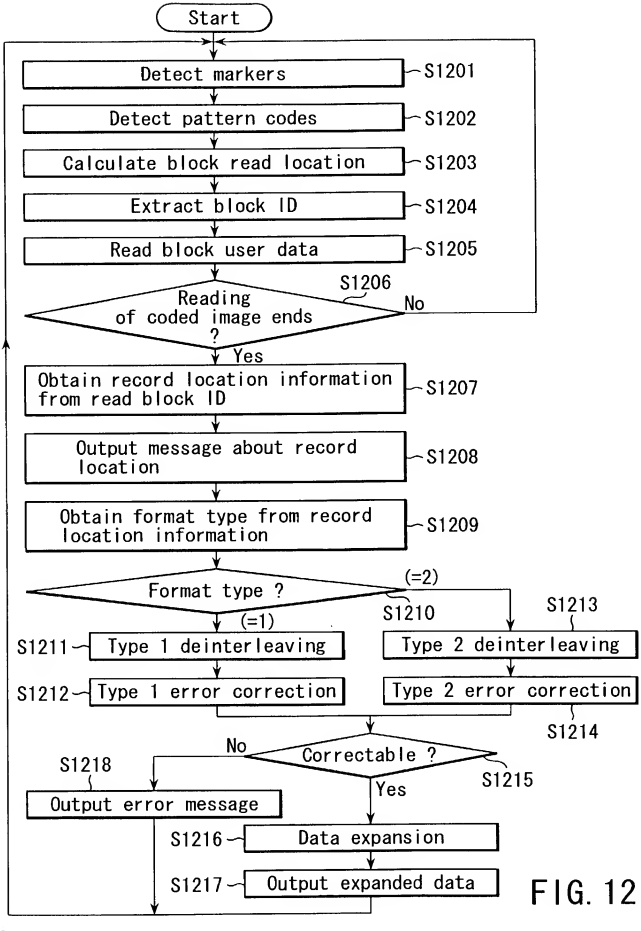

Start
Detect markers
S1201
Detect pattern codes
S1202
Calculate block read location
S1203
Extract block ID
S1204
Read block user data
S1205
S1206
Reading of coded image ends ?
No
Yes
Obtain record location information from read block ID
S1207
Output message about record location
S1208
Obtain format type from record location information
S1209
Format type ?
(=2)
S1210
S1213
(=1)
S1211
Type 1 deinterleaving
Type 2 deinterleaving
S1212
Type 1 error correction
Type 2 error correction
S1214
No
Correctable ?
S1215
S1218
Yes
Output error message
S1216
Data expansion
S1217
Output expanded data

FIG. 12

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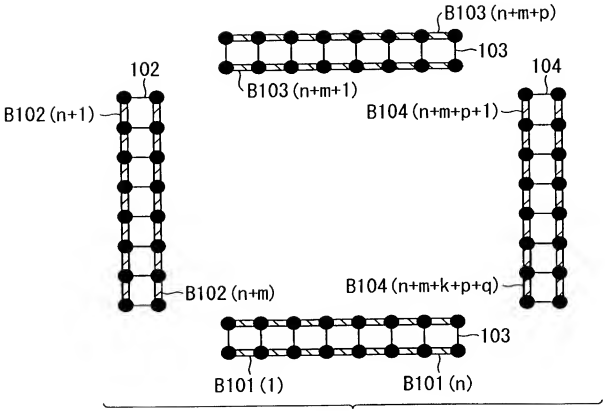

FIG. 13

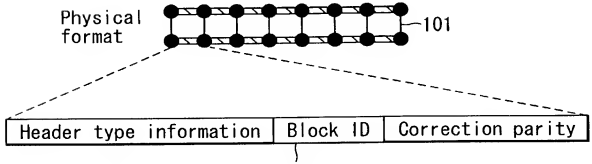

FIG. 14A

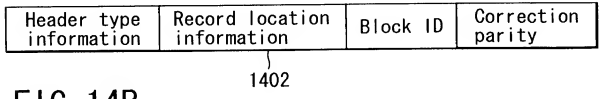

FIG. 14B

2008/126,030 US

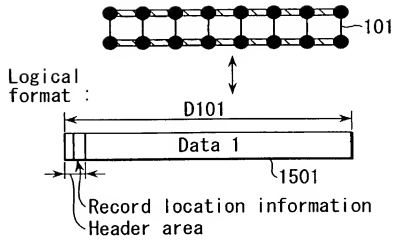

FIG. 15

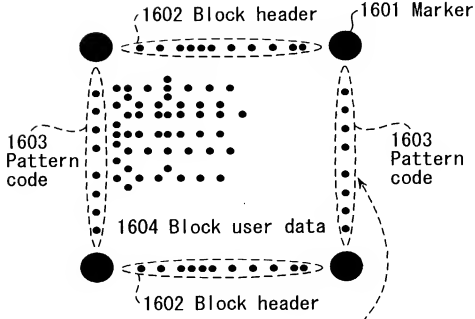

FIG. 16A

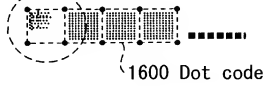

FIG. 16B

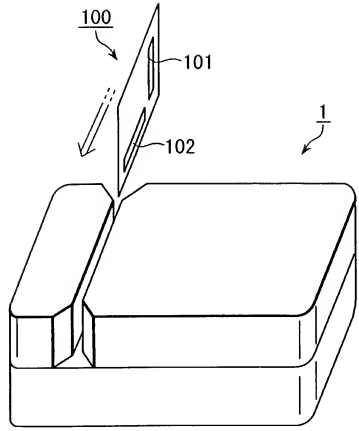

FIG. 17A

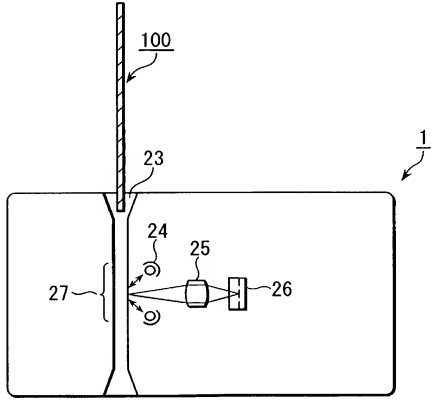

FIG. 17B